INSTRUCTIONS

FOR

WESTON MODEL 769

ELECTRONIC ANALYZER

WESTON ELECTRICAL INSTRUMENT CORPORATION
NEWARK 5, NEW JERSEY, U.S.A.

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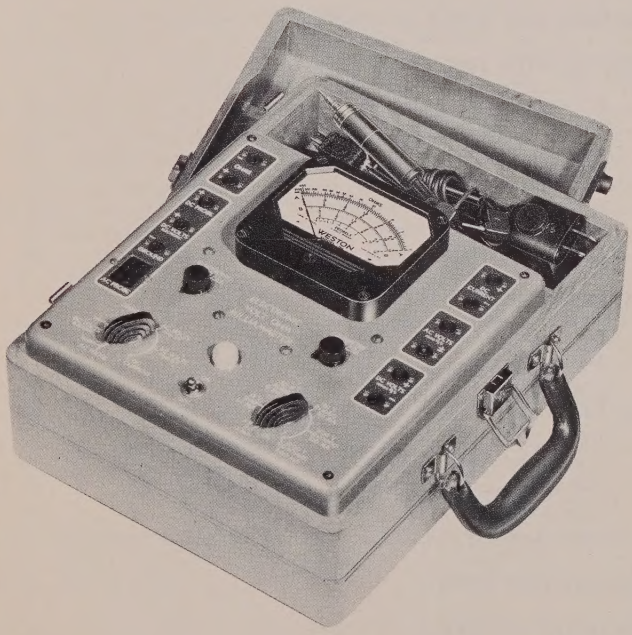
for
WESTON
MODEL 769 ELECTRONIC ANALYZER



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INSTRUCTIONS FOR MODEL 769 ELECTRONIC ANALYZER

GENERAL: The Weston Model 769 is a multi-purpose analyzer and vacuum tube voltmeter providing facilities in one instrument for measurement of practically all voltage, current, and resistance values in electronic equipment. All D-C and A-C voltage ranges are available either as vacuum tube voltmeter ranges or as standard analyzer with the exception that limitations imposed by the diode tube in the probe do not permit readings over 300 volts on the RF probe.

This instrument has been carefully designed to achieve maximum versatility of use, therefore, all possible ranges are made independent of the A-C power lines. Fundamental analyzer ranges are provided for measurement of D-C or A-C voltages, D-C current, and resistance up to 200,000 ohms; these functions requiring no external source of power. The Model 769 may be used as a wide range analyzer in many places where no A-C lines are available such as automobiles, boats, battery operated equipment, planes, etc. Power to operate the three ohmmeter ranges used in this fundamental analyzer is obtained from two flashlight batteries contained within the instrument case.

In addition the Model 769, when plugged into a 105-130 volt, 50-60 cycle power line, may be used as (1) a diode probe type vacuum tube voltmeter for measurement of audio and radio frequency voltages up to 300 volts. (2) A D-C vacuum tube voltmeter up to 1200 volts for measurement of either positive or negative potentials at an input resistance of 15 megohms with or without an isolating probe. (3) An electronically operated ohmmeter to extend the range of resistance measurement up to 2000 megohms.

VOLT-OHM-MILLIAMMETER: The following ranges are available as a completely self-contained analyzer with no connection to the A-C line.

D-C Volts—at 10,000 ohms per volt: 3/12/30/120/300/1200

A-C Volts—at 1,000 ohms per volt: 3/12/30/120/300/1200

Decibels: —6 db to + 62 db at zero level of 1 milliwatt on 600 ohm line

D-C Current: 300 microamperes/1.2/6/30/120/600 milliamperes

Resistance: 2,000/20,000/200,000 ohms full scale*
20/200/2,000 ohms center scale

Accuracy: D-C: ± 3%; A-C: ± 5%

*Ranges from 2 to 2,000 megohms operate electronically.

ELECTRONIC VOLT-OHMMETER:

D-C Volts: 3/12/30/120/300/1200 positive or negative with respect to ground (chassis)

Resistance: 2/20/2000 megohms full scale**
20,000 ohms/200,000 ohms/20 megohms center scale

Voltmeter Resistance: 15 megohms on all ranges

Accuracy: ± 4% of full scale on all ranges

** 3 ranges to measure from 0.5 ohms to 200,000 ohms are also available but are not electronic.

PROBE TYPE VACUUM TUBE VOLTMETER:

A-C RMS Volts: 3/12/30/120

Decibels: — 6 to 42 db

Input Resistance: 5 megohms

Input Capacity: 5 micromicrofarads

Accuracy: ± 5% from 50 cycles to 150 megacycles
± 12% from 150 to 300 megacycles
± 8% (with correction curve) from 150 to 300 megacycles

Max. input voltage to Probe: 500 volts (d-c plus peak to peak a-c).

THE ELECTRONIC AMPLIFIER: A completely new unity gain D-C amplifier is used as a meter amplifier on the electronic ranges. This circuit has unusual stability which permits operation over the full line voltage ranges of 105 to 130 volts with less than 1% zero drift and calibration change on all ranges. The application of both regeneration and degeneration to this amplifier eliminates the necessity of using specially matched or selected tubes. The input resistance of the amplifier is 15 megohms when used as a D-C Vacuum Tube Voltmeter.

THE DC PROBE: This is a four foot red test lead equipped with a banana plug terminal at one end and a test prod at the

other end (The test prod includes a 3 megohm isolation resistor). The lead is used as the high potential lead for D-C electronic voltmeter measurements when plugged into the +DC PROBE pin jack. The standard black four foot test lead is used for the other connections in measuring D-C electronic volts when plugged into the GROUND pin jack. If desired, this combination can be used for any and all D-C voltage readings in conjunction with the internal amplifier. However, the DC Probe is only required in cases where there is a reasonable amount of RF or AF potential superimposed on the D-C voltage to be measured. The probe also limits the insertion capacity of the test lead when taking potential readings in RF circuits.

THE AC PROBE: An insulated AC Probe of novel design is supplied with this instrument. This probe was evolved after considerable study to provide the operator with a flexible arrangement so that the best possible accuracy and minimum loading could be maintained in taking potential readings on VHF as well as high frequency, medium frequency and audio frequency equipments. The size has been held to an absolute minimum to provide the operator with a small device that can be maneuvered easily between complex chassis components. The body of the probe is insulated to avoid short circuits which might be caused by an outside metal shell touching high potential terminals adjacent to the component under test in the chassis.

There are actually three separable accessories which form a part of the probe assembly. They are, the detachable grounding lead, the removable low frequency extension and the removable tip. For best accuracy in taking VHF readings, all three of these accessories should be removed (store accessories in the accessory compartment). The probe was primarily designed for VHF measurements and with these accessories removed it will apply minimum loading to the circuit under test. Refer to the line drawings on Page 11 for illustrations showing what accessories to use for each of the three general frequency classifications. Where readings are required on audio frequency measurements, in general the low frequency extension should be used. This extension contains a larger condenser for low frequency readings. When screwed in position on the end of the probe, it by-passes the probe tip condenser. The test prod tip should be in position on the end of the adapter as shown in Figure 1, Page 11. The tip is designed to be used directly or with a Mueller Electric Company #60 alligator clip.

For audio frequency measurements, the A-C Probe can be used as a single lead, with the black test lead plugged into the GROUND pin jack for the return circuit. For frequencies above 20 kilocycles, it is advisable to use the short probe ground lead with the snap ring. The probe extension or low frequency tip must be used in taking readings below 1,000 cycles. This probe extension will provide essentially flat response down to 50 cycles. The probe may be used down to 5 cycles per second by substituting a .1 microfarad condenser in place of the probe extension supplied with the instrument. A connection must be made mechanically to the outer ring of the ceramic probe tip condenser. To do this, wrap the .1 microfarad condenser lead once around the top of the ceramic condenser and screw the low frequency tip in place clamping the condenser lead in place.

In the range from 1,000 cycles to 20 megacycles the probe should be used without the probe extension, but with the detachable ground clip lead as the return circuit. Refer to Figure 2, Page 11.

For frequencies above 20 megacycles, the probe ground lead should be removed, and the ground connection made by pushing the probe ground ring against the nearest grounded point on the chassis under test. In the frequency range above 20 megacycles it is often advisable to remove the prod tip on the end of the probe. This is especially important when taking readings on equipment operated in the FM and television bands or on higher frequencies up to and above 300 megacycles. The resonant frequency of the probe with the accessories removed as shown in Figure 3, Page 11, is considerably above 500 megacycles. For best accuracy in taking potential readings on circuits in the frequency range above 150 megacycles, a slight correction should be applied in accordance with the correction curve shown on Page 19. This shows the average deviation from the true RF potential readings on frequencies up to 300 megacycles, the top limit of the VHF band.

Note that AC Probe readings on the 12, 30 and 120 volt ranges are taken on the black arc marked "A". Since unavoidable diode curvature is encountered on the low range, readings on the three volt range are taken on the red arc marked "B". A newly designed high perveance diode with a very low input capacity is used in this probe. The assembly is such that all leads are soldered avoiding intermittent connections often encountered in AC Probes where tube sockets are used.

Note that the white line on the body of the probe is the VHF "hand limit" line. This "hand limit" should be observed

when holding the probe close to high frequency circuits to avoid body capacity to the circuit under test. When the AC probe is used, the instrument will read r.m.s. volts on pure sine wave potentials. Where complex wave forms are encountered, the instrument will indicate in terms of .707 times the peak value of the wave.

PANEL LAYOUT: The panel is so arranged that all operations are self-evident as is practicable. The left hand rotary switch (Functional Switch) selects the desired function and the right hand switch (Range Switch) the desired voltage, current or resistance range.

The three pairs of pin jacks to the right of the meter marked DC Current, AC Volts 1000 ohms/volt, and DC Volts 10,000 ohms/volt are used for analyzer ranges where no A-C power is needed for operation under any condition.

The pair of ohms jacks at the top left of the panel operate from self-contained batteries directly on the R, R x 10, and R x 100 ranges. Using these three ranges the resistance between ½ ohm and 200,000 ohms may be measured. For higher resistance the Model 769 may be plugged into the A-C line bringing into operation the R x 1000, R x 10,000 and MEGOHMS ranges, permitting readings up to 2000 megohms using an electronic ohmmeter circuit which employs the same amplifier used for D-C and A-C vacuum tube voltmeter ranges.

The jacks and the 6 prong plug connector enclosed in the long pad directly below the OHMS jacks, are used for D-C and A-C electronic measurements in conjunction with the internal amplifier. The instrument must, therefore, be connected to an A-C power line to energize the amplifier when using these jacks. The Step-By-Step Test Procedure for each of these functions is shown in detail on Pages 10 through 16. Briefly the functions are as follows:

1. *+DC PROBE:* This jack has a larger hole than the other pin jacks and fits the banana type plug on the D-C probe lead. The probe contains a 3 megohm resistor the function of which is to filter out RF or AF voltages from a D-C source to be measured. The D-C probe is used when taking D-C vacuum tube voltmeter readings when there is an A-C component present.

2. *+DC VOLTS ELECTRONIC:* This jack is used for D-C V.T.V.M. readings when pure D-C having no RF or AF component is to be measured. A typical example of such a reading would be the AVC voltage measured at a point following the first R-C filter.

3. *GROUND:* The D-C PROBE jack and the D-C VOLTS ELECTRONIC jack are marked (+) and the GROUND jack is marked (—). These markings indicate the polarity condition of the voltmeter ranges when the Functional Switch is in the DIRECT or D-C VOLTS position. Note that the jack marked GROUND is connected directly to the panel to obtain good shielding. It is important for the operator to connect this ground jack directly to the chassis or the low potential side of the circuit under measurement at all times. This is especially important when using the 300 and 1200 volt D-C electronic ranges. If this precaution is not observed, the operator may be exposed to severe shock due to the difference in potential between the chassis under test and the panel of the Model 769.

   Note that the selector switch has a REVERSE position for D-C electronic volts. If potentials negative to chassis potential are to be measured this switch should be indexed to the REVERSE position. The GROUND jack of the Model 769 may still be connected to the chassis of the equipment under test. This, of course, reverses the panel polarity markings with up scale deflections on the meter corresponding to the negative potentials on the + DC PROBE and DC VOLTS ELECTRONIC jacks.

4. *AC PROBE:* This socket fits the plug on the flexible cable of the AF and RF probe. All necessary connections are made by this plug and it is not necessary to use the ground jack. Measurements between 1000 cycles and 300 megacycles are made using only the probe body. This probe is adapted for audio and low radio frequency use from 50 cycles to 200,000 cycles by screwing on the extension furnished.

SCALES: The scale is divided into four arcs:

(1) The ohmmeter arc at the top having divisions from 0.5 ohms to 2000 ohms and a 20 ohm center value. All ohm ranges except MEGOHMS are read by applying the multiplying factor marked on the panel for that particular range. Megohms are read directly on this top scale thus giving 20 megohms at center and 2000 megohms at top scale.

(2) The black arc marked A is used for the following ranges: All D-C; A-C probe ranges 12-30-120 volts.

(3) The red arc marked B is used for the following: All A-C 1000 ohms/volt ranges; 3 volt A-C probe range.

(4) The decibel arc at the bottom, calibrated from —6 to +10 decibels, reads directly on the 3 volt range.

DECIBEL READINGS: A decibel arc calibrated from −6 to +10 db is included as the inside arc on the instrument scale for db readings above or below a 1 milliwatt level on 600 ohm lines. Readings on this arc require no multiplying factor when the Range Switch is indexed to the 3 volt position. On all higher ranges, a factor must be added as shown for each range in the table below.

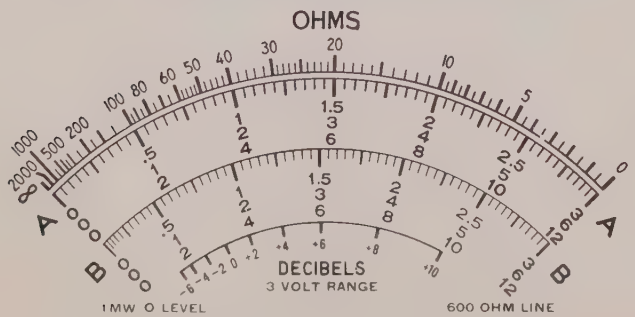
Switch Position	Add to Meter Reading
3 v	0
12 v	+ 12 db
30 v	+ 20 db
120 v	+ 32 db
300 v	+ 40 db
*1200 v	+ 52 db

* 1000 ohm per volt A-C range only.

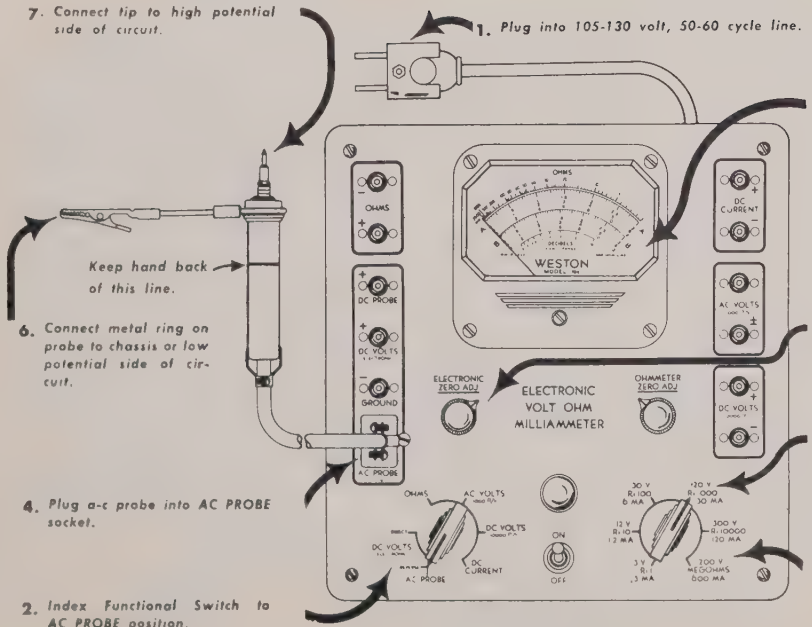
If the instrument is being used on any range above the 3 volt range, add to the instrument reading the db factor as listed above.

If decibel readings are required at other levels, and on 500 or 600 ohm lines, refer to the table on page 20. To obtain the decibel level, note the voltmeter reading under test conditions, refer to the nearest value in the second, third or fourth column depending upon the line impedance and the required zero level, and note the corresponding decibel figure in the first column. Conversely, the required voltage readings for any particular decibel level can be noted by referring to either the second, third or fourth column as required.

ACTUAL SIZE SCALE OF MODEL 769



A-C Voltage Measurements (Electronic)



7. *Connect tip to high potential side of circuit.*

1. *Plug into 105-130 volt, 50-60 cycle line.*

Keep hand back of this line.

6. *Connect metal ring on probe to chassis or low potential side of circuit.*

4. *Plug a-c probe into AC PROBE socket.*

2. *Index Functional Switch to AC PROBE position.*

8. *Take reading on scale marked "B" for 3 volt probe range.*

Take reading on scale marked "A" for ranges of 12-30-120 volts.

5. *Set meter pointer to zero with no voltage applied to AC PROBE.*

3. *Index Range Switch to desired volt range starting with a high range. (120 volt range is maximum for a-c probe readings.)*

NOTE: 1200 volt range is not used on A-C Probe.

— Notes On Use of A-C Probe —

Use only the 3-12-30-120 volt ranges.

Front panel of Model 769 is grounded, therefore always connect metal Grounding Ring on probe to chassis or low potential side of circuit.

Maximum voltage allowed on A-C Probe is 500 volts. (d-c plus peak to peak a-c).

Suggested Uses of A-C Probe

Suggested Uses of A-C Probe

FIGURE 1—Audio and Supersonic Frequencies (Minimum 50 cycles—Maximum 200 kilocycles)

FIGURE 2—Frequencies Up to 20 Megacycles (Minimum 1000 cycles—Maximum 20 megacycles)

GROUND
A-C PROBE
Keep hand back of this line.
Ground Clip may be used for convenience up to 20 megacycles. At higher frequencies remove clip and ground probe directly to chassis as illustrated in Figure 3.
To point of measurement.

FIGURE 3—Frequencies Above 20 Megacycles (Minimum 1000 cycles—Maximum 300 megacycles)

GROUND
A-C PROBE
Keep hand back of this line.
Ground to low potential side of circuit as close to point of measurement as possible.
Remove Tip for low loading at frequencies near and above 100 megacycles.

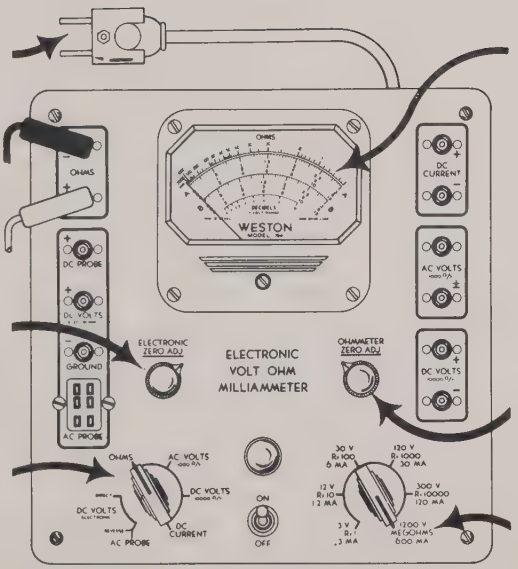
STEP-BY-STEP TEST PROCEDURE

1. *Plug into 105-130 volt, 50-60 cycle line.* (Not required on 3 lowest ranges.)

4. *Plug Black test lead in —OHMS pin jack.*
   Plug Red test lead in + OHMS pin jack.

5. *Set pointer to zero deflection (∞ ohms) using ELECTRONIC ZERO ADJUSTER.* (Test leads not shorted.)

2. *Index Functional Switch to OHMS position.*



7. *Read resistance on this arc using multiplying factor in accordance with Range Switch setting.* (Note: 0-2000 megohms are read directly on OHMS scale.)

6. *Short test leads together and set pointer to top scale position by rotating OHMMETER ZERO ADJUSTER.*

3. *Index Range Switch to desired ohms range position.*

— CAUTION —
Be sure the equipment under test is not energized when using any of the ohmmeter ranges.

— NOTE —
When checking electrolytic condensers for leakage the Red lead will be positive when connections are made as in Step 4.

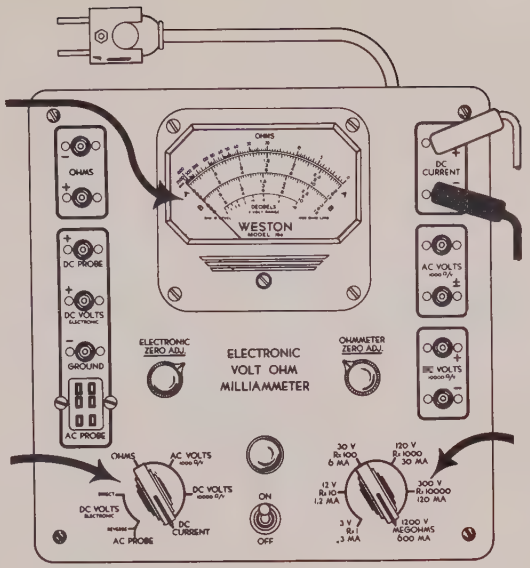
Ohm and Megohm Measurements

D-C Current Measurements

D-C Current Measurements

4. *Take reading on arc marked "A", i.e.,*

Switch Setting	*Scale Used*
300 μa	*3 x 100*
1.2 ma	*12 ÷ 10*
6 ma	*6 Full Scale*
30 ma	*3 x 10*
120 ma	*12 x 10*
600 ma	*6 x 100*



1. *Index Functional Switch to DC CURRENT position.*

2. *Index Range Switch to desired current range.*

3. *Plug Black test lead in — DC CURRENT pin jack.*

Plug Red test lead in + DC CURRENT pin jack.

— NOTE —

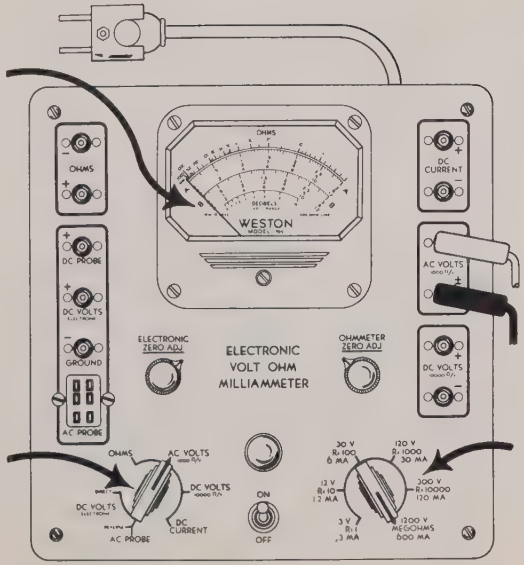
NO A-C POWER IS REQUIRED FOR D-C CURRENT READINGS.

A-C Voltage Measurements (at 1000 ohms per volt)

A-C Voltage Measurements (at 1000 ohms per volt)

4. *Take readings on arc marked "B", i.e.,*

Switch Setting	*Scale Used*
3 v.	*3 Full Scale*
12 v	*12 Full Scale*
30 v	*3 x 10*
120 v.	*12 x 10*
300 v	*3 x 100*
1200 v . .	*12 x 100*



1. *Index Functional Switch to AC VOLTS 1000Ω/v position.*

2. *Index Range Switch to desired volt range.*

3. *Plug test leads into AC VOLTS 1000Ω/v pin jacks.*

— NOTE —

NO A-C POWER IS REQUIRED FOR A-C VOLTAGE READINGS AT 1000 OHMS PER VOLT

D-C Voltage Measurements (Electronic)

1. *Plug into 105-130, 50-60 cycle a-c line.*

6. *Use DC PROBE lead if the d-c voltage has an AF or RF component.*

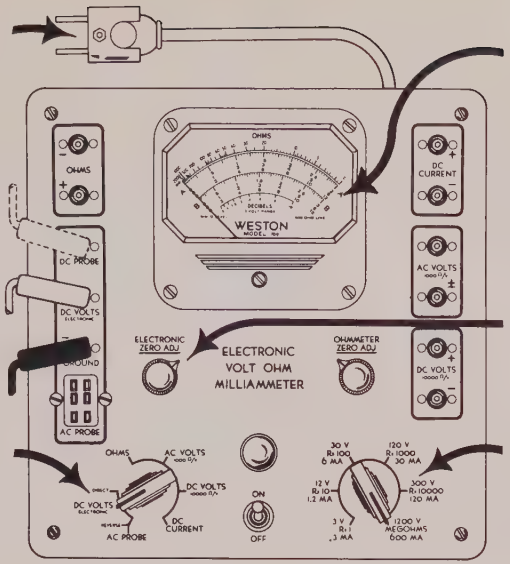
5. *Connect Red test lead to +DC VOLTS ELECTRONIC if measuring pure d-c.*

4. *Connect Black test lead to chassis or low potential side of circuit under measurement.*

2. *Index Functional Switch to DC VOLTS ELECTRONIC:*

   (a) Use DIRECT position if the voltage to be measured is (+) with respect to chassis.

   (b) Use REVERSE position if the voltage is (—) with respect to chassis.



8. *Take reading in arc marked "A", i.e.,*

Switch Setting	*Scale Used*
3 v.	*3 Full Scale*
12 v.	*12 Full Scale*
30 v.	*3 x 10*
120 v	*12 x 10*
300 v.	*3 x 100*
1200 v.	*12 x 100*

3. *Set meter pointer to zero with no voltage applied to test prods by rotating ELECTRONIC ZERO ADJUSTER.*

7. *Index Range Switch to desired volt range.*

— CAUTION —

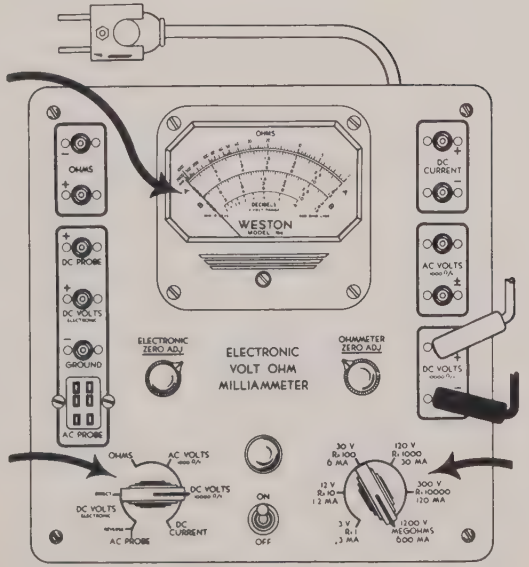
The front panel of Model 769 is grounded, therefore always connect ground jack to chassis or low potential side of circuit under test.

D-C Voltage Measurements (at 10,000 ohms per volt)

D-C Voltage Measurements (at 10,000 ohms per volt)

4. *Take reading on arc marked "A", i.e.,*

Switch Setting	Scale Used
3 v	3 Full Scale
12 v	12 Full Scale
30 v	3 x 10
120 v	12 x 10
300 v	3 x 100
1200 v	12 x 100



1. *Index Functional Switch to DC VOLTS 10,000Ω/v position.*

2. *Index Range Switch to desired volt range.*

3. *Plug Black test lead in —DC VOLTS pin jack.*

Plug Red test lead in + DC VOLTS pin jack.

— NOTE —

NO A-C POWER IS REQUIRED FOR D-C VOLTAGE READINGS AT 10,000 OHMS PER VOLT

MAINTENANCE

BATTERIES: Two internal 1½ volt flashlight type batteries are used for operating the ohmmeter ranges. They are the standard #2 size. When it is impossible to bring the instrument pointer to the zero resistance or full scale reading with the test leads shorted on the low ohmmeter or R range, these batteries should be replaced.

BATTERY REPLACEMENT: The batteries are held in clamps in the bottom of the case. 1. Remove the four corner panel screws and lift the complete panel assembly out of the case. 2. Place the thumb over the positive end of the clamp pressing towards the battery. 3. Pull up the ring clamp. 4. Pull the battery up and out of the clamps. 5. Replace the battery, fasten the open end of the ring clamp over the projections at the negative end. 6. Snap the ring down over the thumb clamp at the positive end.

FUSES: The Model 769 is insulated from the power line, and both line cord conductors are fused. The two fuses are mounted in the line cord plug. If the device will not operate, and the pilot lamp does not glow when the switch is turned on, check the A-C line potential using the 300 volt 1000 ohms per volt A-C range. If the line is energized, check the fuses in the plug using the R or R x 10 range. This may be done without removing the fuses from the plug. Also check between line terminals with the power switch on, to be sure the fuses are making contact. Replace the fuses with an automobile fuse type 3AG, with a 1 ampere rating.

PILOT LAMPS: The pilot light used is a brown bead 6.3 volt miniature bayonet base lamp. To replace: Remove the plastic cap and insert a new lamp.

TUBES: The amplifier section includes 4 tubes and 2 neon regulator lamps. Since all of the tubes are operated at relatively low potentials, long operating life may be expected. The amplifier, however, is self-balancing to the extent that tube changes will not affect the operation of the device.

If at any time it is necessary to replace any of the tubes, remove the 4 corner panel screws and lift the panel assembly out of the case. The tube type numbers are marked on the chassis next to the sockets. The tube complement consists of:

2	type	6SJ7 Tubes	1	type	6x5 Rectifier
1	type	6SL7 Tube	2	type	991 Neon Glow Lamps

If the device appears to be defective on all electronic functions the tubes should be examined and replaced as required. After replacement it may be advisable to check the Model 769 for excessive grid current in the input 6SJ7 tube. This is the tube furthest from the panel.

PROBE TUBE REPLACEMENT: The sub miniature diode tube in the AC or RF probe is operated under very conservative conditions and should render long service without any need for replacement. The very short tube leads are soldered in place in the tip, and are not accessible without small tools and a very small soldering iron.

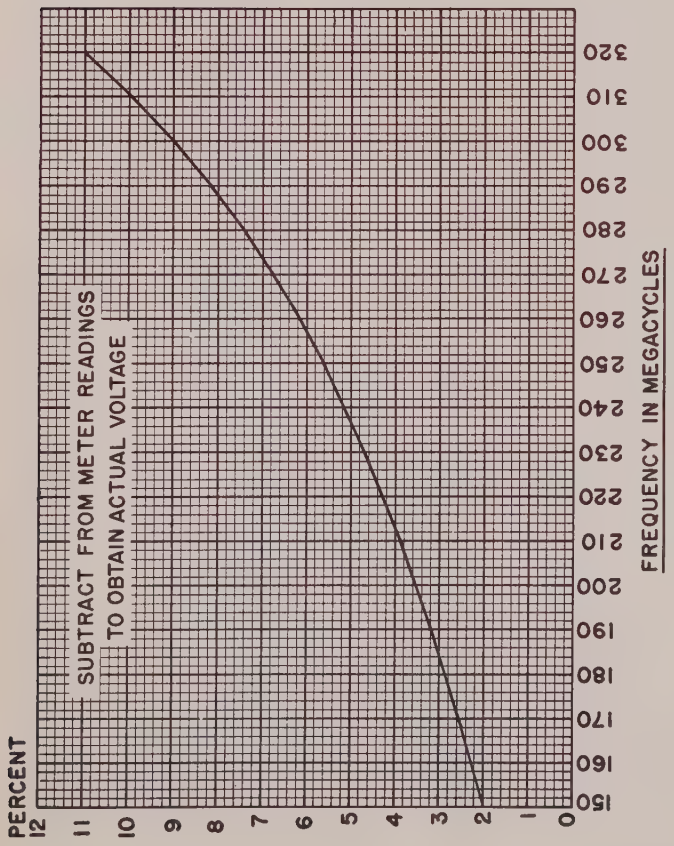
The polystyrene head may be damaged in attempting to replace the tube with the wrong tools. Accordingly it may be advisable to send the probe to the Weston Repair Service Division for tube replacement. The repaired unit will be mailed at a nominal charge within two days from time of receipt at the Weston factory. It is not necessary to return the complete instrument for tube probe replacement. **Return RF Probe Only.**

TEST FOR EXCESSIVE GRID CURRENT IN THE INPUT 6SJ7 TUBE: 1. Operate the device on the 3 volt D-C electronic range. 2. Warm up the equipment for three to five minutes. 3. Short circuit the three volt input by connecting the +DC VOLTS ELECTRONIC jack to the GROUND jack. 4. Using the ELECTRONIC ZERO ADJUSTMENT, set the instrument pointer to zero. 5. Open the circuit by removing the shorting lead from both jacks. 6. If the pointer moves more than one division on the D-C scale, the input 6SJ7 should be replaced by a new tube if first interchanging the two 6SJ7 tubes does not correct the fault.

GLOW LAMPS: The two type 991 glow lamps will very seldom require replacement. However, if this is necessary, unsolder the two short flexible leads connected to the base terminals of the lamp and remove the lamp from the clip. Replace as required and solder the leads in position.

CARE OF ACCESSORIES: When not in use the RF Probe, Test Leads and other Accessories should be carefully stored in the accessory compartment. To assure long service of the accessories handle them with reasonable care and check the test leads periodically for continuity.

CORRECTION CURVE



DATA ON DB LEVELS

Power Level DB	Volts, based on ODB of 6 MW in 500 Ohms	6 MW in 600 Ohms	1 MW in 600 Ohms
—10	0.548	0.600	0.245
— 9	0.614	0.673	0.275
— 8	0.689	0.755	0.308
— 7	0.774	0.847	0.346
— 6	0.868	0.951	0.388
— 5	0.974	1.067	0.436
— 4	1.093	1.197	0.489
— 3	1.226	1.343	0.548
— 2	1.376	1.507	0.615
— 1	1.544	1.691	0.690
0	1.732	1.897	0.775
+ 1	1.943	2.129	0.869
+ 2	2.180	2.389	0.975
+ 3	2.447	2.680	1.094
+ 4	2.745	3.007	1.228
+ 5	3.080	3.374	1.377
+ 6	3.456	3.787	1.545
+ 7	3.878	4.248	1.734
+ 8	4.351	4.766	1.946
+ 9	4.882	5.347	2.183
+10	5.477	6.000	2.449
+11	6.145	6.732	2.748
+12	6.895	7.554	3.084
+13	7.737	8.475	3.460
+14	8.681	9.509	3.882
+15	9.740	10.67	4.356
+16	10.93	11.97	4.887
+17	12.26	13.43	5.484
+18	13.76	15.07	6.153
+19	15.44	16.91	6.904
+20	17.32	18.97	7.746
+21	19.43	21.29	8.691
+22	21.80	23.89	9.752
+23	24.47	26.80	10.94
+24	27.45	30.07	12.28
+25	30.80	33.74	13.77
+26	34.56	37.87	15.45
+27	38.78	42.48	17.34
+28	43.51	47.66	19.46
+29	48.82	53.48	21.83
+30	54.77	60.00	24.49
+31	61.45	67.32	27.48
+32	68.95	75.54	30.84
+33	77.37	84.75	34.60
+34	86.81	95.09	38.82
+35	97.40	106.70	43.56
+36	109.3	119.7	48.87
+37	122.6	134.3	54.84
+38	137.6	150.7	61.53
+39	154.4	169.1	69.04
+40	173.2	189.7	77.46
+41	194.3	212.9	86.91
+42	218.0	238.9	97.51
+43	244.7	268.0	109.4
+44	274.5	300.7	122.8
+45	308.0	337.4	137.7
+46	345.6	378.7	154.6
+47	387.8	424.8	173.4
+48	435.1	476.6	194.6
+49	488.2	534.7	218.3
+50	547.7	600.0	245.0

PARTS LIST FOR MODEL 769

DESCRIPTION	PART NUMBER
AC Probe	D-118970
Ground Lead for Probe	D-118974
Low Frequency Tip for Probe	D-118977
Condenser—	
510 mmf. Ceramic (Erie style K)	ND-24038
.01 mfd. 300 Volt Mica	ND-24039
.005 mfd. 1000 Volt Mica	ND-24040
.02 mfd. 400 Volt Paper	ND-23666
10-10 mfd. 450 Volt Electrolytic	ND-24032
DC Probe	D-118886
Knob—(bar type)	D-83038
Screw for Knob	D-76857
Knob—(for rheostats)	ND-23835
Lamp—G.E. Neon type NE-16 or R.C.A. 991	ND-24029
Lamp—6 Volt Pilot—G.E. No. 47	ND-20566
Line Cord and Plug	D-76868
Meter—Model 801, 100 Microampere DC	Spec. 769 Sub 1
Resistor—	
5.6 Ohm, ½ Watt W.W.	ND-26873
5100 Ohm, ½ Watt Carbon	ND-20034
51000 Ohm, ½ Watt Carbon	ND-20024
100,000 Ohm, ½ Watt Carbon	ND-20023
2 Meg., ½ Watt Carbon	ND-24093
6 Meg., ½ Watt Carbon	ND-24094
12 Meg., ½ Watt Carbon	ND-24095
60 Meg., ½ Watt Carbon	ND-24096
Resistor—Ceramic Tube Type	
90,000 Ohms	D-118903
180,000 Ohms	D-108940
200,000 Ohms	D-108941
250,000 Ohms	D-112378
750,000 Ohms	D-108946
900,000 Ohms	D-108960
1 Meg.	D-108948
1.8 Meg.	D-108961
3 Meg.	D-108949
9 Meg.	D-108962
10 Meg.	D-108953
Resistance Spool—# 99 type 0.25 Ohm	D-118893

PARTS LIST FOR MODEL 769

DESCRIPTION	PART NUMBER
Resistance Spool—#139 type	
1 Ohm	D-118897
3.75 Ohms	D-118898
20 Ohms	D-118899
100 Ohms	D-118900
201.4 Ohms	D-118901
375 Ohms	D-118902
2000 Ohms	D-118903
2143 Ohms	D-118904
3000 Ohms	D-118905
Resistance Spool—#109 type	
9000 Ohms	D-118906
18,000 Ohms	D-118907
20,000 Ohms	D-72374
23,000 Ohms	D-118908
Rectifier Circuit Assembled and Adjusted	D-118927
Rheostat—15,000 & 2,000 Ohms (Ohmmeter)	D-125870
Rheostat—25,000 & 2 Megohms (Electronic)	D-125871
Socket—Amphenol #74-8 Octal	ND-24025
Switch—Range Selector, 4 Deck	D-118889
Switch—Circuit Selector, 3 Deck	D-118888
Switch—SPDT Toggle	ND-22712
Test Lead—Black	D-70033
Test Lead—Red	D-70034
Transformer	D-118885
Tube—Type 6X5	
Tube—Type 6SL7	
Tube—Type 6SJ7	

MP MASTER
MA35472